



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

D4680-041

Job Sheet 179485



Part No: D4680-041

Job Qty: 1 ea

Part Name: Skidtube Assembly



Part Weight: 0 lbs

Status: Scheduled

Priority: Medium

Job Created: 6/19/18

Job Tracking No:

Due Date: 7/11/18

Created By: Jesse White

Type: SOLD

Description:

Note: DWG REV F IPP REV:A 13.04.16 NEW ISSUE DD VERF:JLM IPP REV:B 13.08.08 PB2 DD VERF:JLM IPP REV:C 13.09.10 PB3 DD VERF:JLM IPP REV:D 13.11.14 AS PER DWG REV.B DD VERF:JLM IPP REV:E 14.11.24 AS PER DWG REV.C DD VERF:JLM IPP REV:D 15.06.10 AS PER DWG REV.D DD VERF:JLM IPP REV:E 16.03.23 AS PER DWG REV.E DD VERF:JLM

Ship Via:

Bill of Materials

Job Routing

Op No	Operation	Qty	Start Date	Due Date	Standard		Workcenter/Supplier		Sign-off
					Setup hrs	Run Hrs	Workcenter / Supplier	Lead Time	
90	Start up Operation	1 Ea	7/11/18	7/11/18	0.00	0.00	Start Up Skid tubes-2		
120	Skid tubes	1 pcs	7/11/18	7/11/18	0.00	4.86	Skid tubes-2		
140	QC	1 pcs	7/11/18	7/11/18	0.00	0.00	QC5		
150	HandFinish	1 pcs	7/11/18	7/11/18	0.00	0.73	HandFinish1		
160	QC	1 pcs	7/11/18	7/11/18	0.00	0.00	QC7-4		
170	Skid tubes	1 pcs	7/11/18	7/11/18	0.00	4.86	Skid tubes-2		
180	QC	1 pcs	7/11/18	7/11/18	0.00	0.00	QC5		
210	HandFinish	1 pcs	7/11/18	7/11/18	0.00	0.73	HandFinish2		
220	Powdercoat	1 pcs	7/11/18	7/11/18	0.00	0.17	Powdercoat1		
230	QC	1 pcs	7/11/18	7/11/18	0.00	0.00	QC3		
260	HandFinish	1 pcs	7/11/18	7/11/18	0.00	0.73	HandFinish4		
270	QC	1 pcs	7/11/18	7/11/18	0.00	0.00	QC5		
300	Packaging	1 pcs	7/11/18	7/11/18	0.00	0.00	Packaging3-2		
310	QC21-SA	1 Ea	7/11/18	7/11/18	0.00	0.00	QC21		

Part Op 120 - 1-Cut Aft end as per dwg D4680 3-Drill Aft & Fwd Cap holes using DT8678 & DT8901 open aft cap 0.187". 4-Locate Descriptions: DT10149 & Drill Ground wire hole on top of Tube. 5-Locate DT10149 with 0.187" cleco in aft cap, then Pilot Drill all X-Bolt holes using 0.187" drill. 6-Open ground wire hole .297" at 95.75" (1 at fwd end & 2 at aft end at 20.81" ref.) 8- 3 most fwd x-bolt holes must be laid out manually, open to #30. 9-Open Aft & Fwd Cap holes using .208" drill. 10- Open X-Bolt holes to .750" (10 places) 11- Drill Rivet Holes as per Dwg D4680 using DT10065 ***DO NOT DRILL RIVET HOLES ON SECTION G-G (TWO PLACES) Open G-G to .750 12-Deburr holes.

170 - 1- Bond web as per Dwg D4680 & QSI 015 2- Seal all faying surfaces using proseal and rivet Doubler as per Dwg D4680. A/R Proseal Batch: 13848 exp date: 2018/11 ***LET IT CURE FOR 7HRS*** START TIME: FINISH TIME: 3- Rivet doublers as per dwg Shave rivet as required, remove

Proseal spill over. 4- Ream holes section C-C as per dwg, deburr 8 places 5- Swage x-bolt spacers as per Dwg D4680 and section C-C 8 places. 6- Swage x-bolt spacer as per dwg D4680 section G-G 7- Trim/Grind flush per QSI 002 210 - Re-alodine tube as per QSI 005 section 4.1.2.1 do not acid etch.

220 - START TIME: Primer 5084461 Paint 138886

260 - 1- Install Ground Wire inserts as per Dwg D4680. 2-Inspect for Foreign objects 3- Install Fwd & Aft caps as per Dwg D4680 and Detail "A" & "B". Fastener must be install wet as per note (9). Seal all faying surfaces note (8) A/R 241 Sika Flex Batch: M138787 Exp Date: 18/12 4- Wing Walk as per Dwg D4680 and QSI 005 4.4

Batch: 5080995

Plex 6/19/18 3:08 PM dart.white.jesse

Job BOM

Part / Item	Component Name	Quantity	Operation	Container
D4680-041-BENT	Extrusion Bent	1 Ea (1 ea)	90-Start up Operation	5088995
D5520-1	Doubler	2 Ea (2 ea)	120-Skidtubes	5082764
CR3212-5-05	Rivet	68 pcs (68 ea)	170-Skidtubes	506120
D4681-041	Web Assembly	1 Ea (1 ea)	170-Skidtubes	5091124
AELS-1032-130	Rivnut	3 Ea (3 ea)	260-HandFinish	5007279
AN3C4A	Bolt	3 Ea (3 ea)	260-HandFinish	5068642
AN3C5A	Bolt	2 Ea (2 ea)	260-HandFinish	5057153
AN526C1032R10	Screw	2 Ea (2 ea)	260-HandFinish	5071664-2
D2965	Cap	1 Ea (1 ea)	260-HandFinish	5045482
D2965-3	Cap	1 Ea (1 ea)	260-HandFinish	F126369
D4686-1	Spacer	8 Ea (8 ea)	260-HandFinish	5063813
D5304-1	Crossbolt Spacer	2 Ea (2 ea)	260-HandFinish	5018583
MS20601-AD4W3	Rivet	32 Ea (32 ea)	260-HandFinish	5092687
NAS1149C0332R	Washer	5 Ea (5 ea)	260-HandFinish	5056493
D4753-1	Doubler	16 Ea (16 ea)	300-Packaging	5069627, 5083133 X15

Job Allocations

Operation	Component Part	Required	Inventory	Allocated
90-Start up Operation	D4680-041-BENT	1	1	0
120-Skidtubes	D5520-1	2	10	0
170-Skidtubes	CR3212-5-05	68	740	0
	D4681-041	1	2	0
260-HandFinish	AELS-1032-130	3	0	0
	AN3C4A	3	1,807	0
	AN3C5A	2	1,655	0
	AN526C1032R10	2	178	0
	D2965	1	80	0
	D2965-3	1	30	0
	X D4686-1 X	8	82	0
	X D5304-1 X	2	27	0
	X MS20601-AD4W3 X	32	1,163	0
	NAS1149C0332R	5	5,349	0
300-Packaging	D4753-1	16	136	0

Part Specifications

Specifications could not be found.

004621

Part: D4680 - 041
 Job No: 179485
 Serial No/Batch: S091305
 Revision: F
 Inspector:
 Exp Date:
 Instructions:

Date: 07/12/18



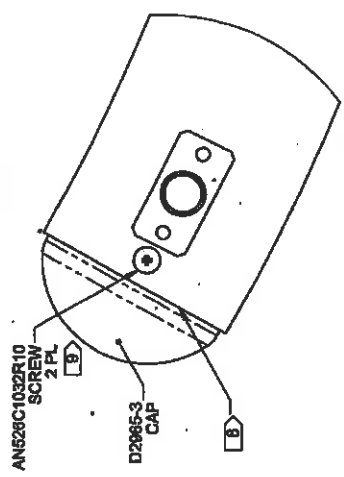
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 AEROSPACE

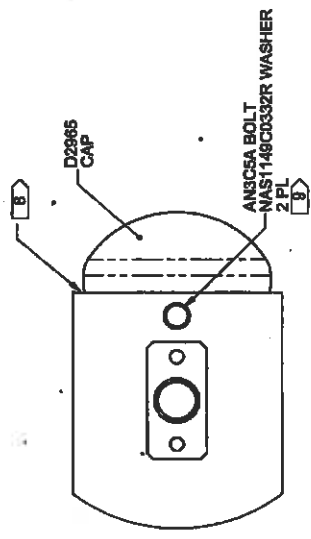
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 TEL: 613 832-6200
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dart.white.jesse

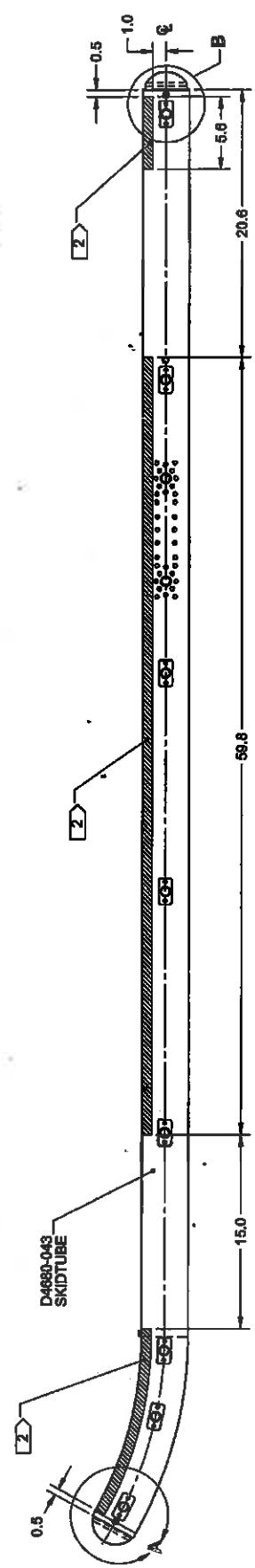
2 3 4 5 6 7 8



DETAIL A
SCALE 4X



DETAIL B
SCALE 4X

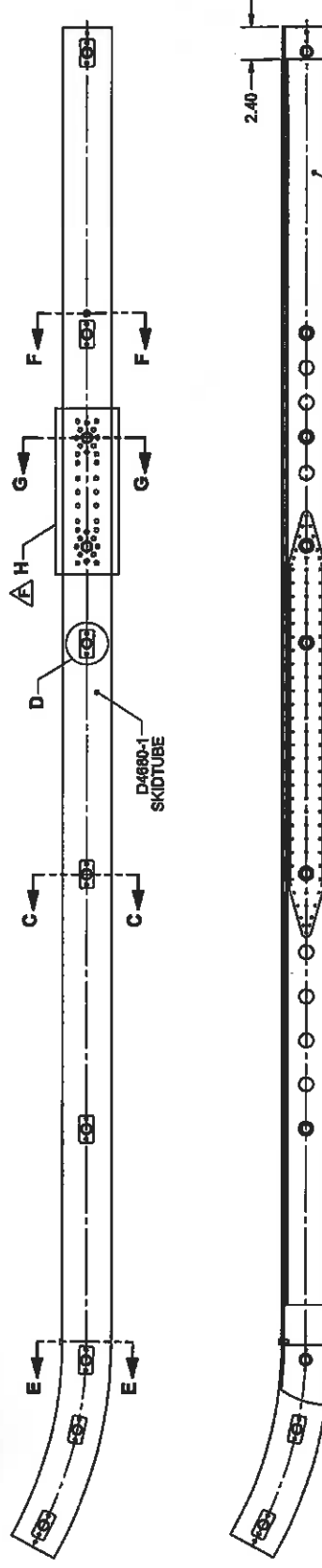
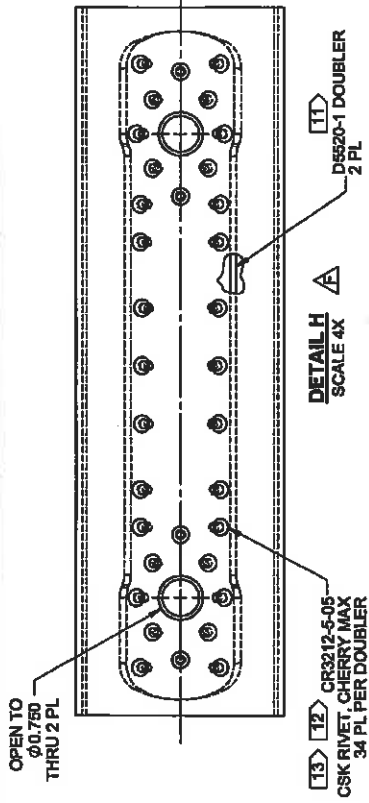


DESIGN	AP	AP	DART AEROSPACE USA, INC.
DRAWN	AJS	ML	EDGEM, OR
CHECKED	ML	DP	DRAWING NO. D4880
MFG. APPR	WM	DP	REV. F
APPROVED	DS	DP	SHEET 2 OF 5
DE APPR	DS	DP	SCALE
DATE	17.03.30	DS	NTS

RELEASED
2017-08-11
APPROVED

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ITEM	QTY	P/N	DESCRIPTION
	X	D4680-043	SKIDTUBE SUB ASSY
1	1	D4680-1	SKIDTUBE
2	1	D4681-041	WEB ASSY
3	8	D4686-1	SPACER
4	16	D4753-1	DOUBLER
5	2	D5304-1	CROSSBOLT SPACER
6	2	D5520-1	DOUBLER
7	3	A13C4A	BOLT
8	32	MS20601AD4W3	RIVET, BLIND, CSK
9	3	NAS1148C0332R	WASHER
10	3	AEL8-1032-150	INSERT
11	68	CR3212-5-05	CSK RIVET, CHERRY MAX



D4680-043 SKIDTUBE SUB ASSY

- NOTES:
- 1) MATERIAL: N/A
 - 2) FINISH: POWDER COAT WHITE (REF. 4.3.6.1) PER DART QSI 005 4.3
 - 3) TOLERANCES: PER DART QSI 016 UNLESS OTHERWISE NOTED
 - 4) UNITS: INCHES UNLESS OTHERWISE NOTED
 - 5) BREAK SHARP EDGES: N/A
 - 6) IDENTIFICATION: NONE
 - 7) WEIGHT: 18.6 lbs
 - 8) SEAL ALL MATING SURFACES USING PROSEAL 8801422 OR MIL-S-8802 CLASS B2 SEALANT
 - 9) INSERT D4681-041 WEB INTO D4680-1 SKIDTUBE IN LOCATION SHOWN OFF AFT END OF SKIDTUBE AND BOND WEB INTO OUTER TUBE WITH NON-STRUCTURAL SIKAFLEX-241/281 ADHESIVE PER DART QSI 015
 - 10) INSTALL D4686-1 SPACER AFTER INSTALLING D4753-1 DOUBLERS
 - 11) LOCATE THE D5520-1 DOUBLER USING THE Ø0.188 PILOT HOLES ON THE SKIDTUBE AND DOUBLER
 - 12) LOCATE QTY (34) HOLES ONTO THE SKIDTUBE PER D5520-1 DOUBLER AND DRILL Ø0.161 THRU SKIDTUBE AND DOUBLER USING DT10308
 - 13) COUNTERSINK THE SKIDTUBE Ø0.286 X 100° (34 PL) AND INSTALL EACH D5520-1 DOUBLER USING QTY (34) CR3212-5-05 CSK RIVETS

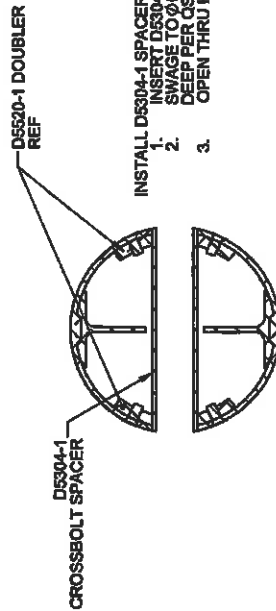
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2017-08-11

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DART AEROSPACE USA, INC. EUGENE, OR								
DRAWING NO. D4680								REV. F
TITLE SKIDTUBE								SHEET 3 OF 5
SCALE NTS								NTS

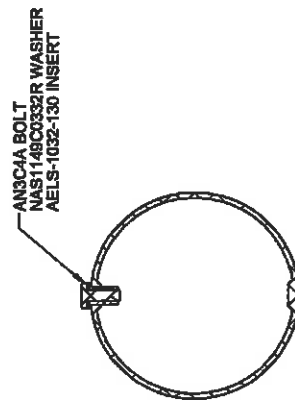
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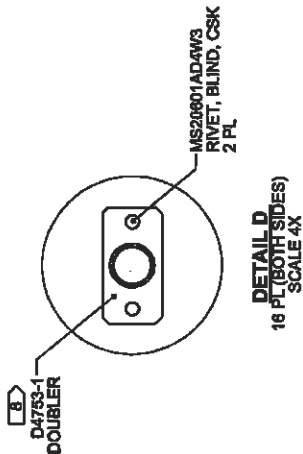
SECTION C-C
SCALE 4X
8 PL



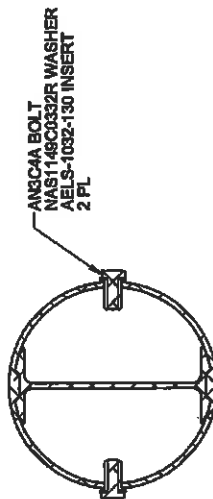
SECTION G-G
SCALE 4X
2 PL



SECTION E-E
SCALE 4X



DETAIL D
18 PL (BOTH SIDES)
SCALE 4X

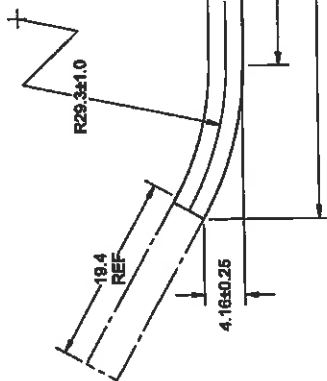


SECTION F-F
SCALE 4X

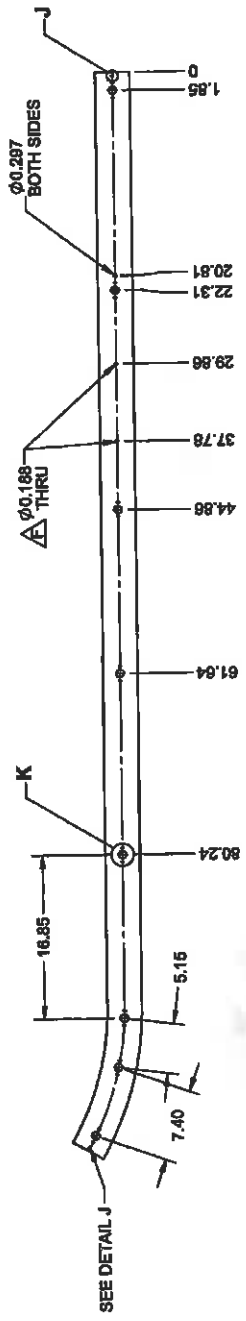
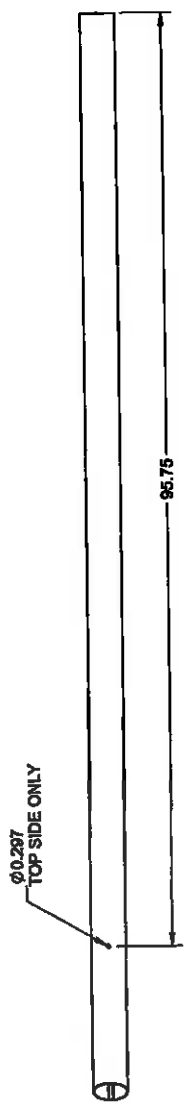
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CHECKED	ML	DRAWING NO.	REV. F	
MFG. APPR.	DP	D4680	SHEET 4 OF 5	
	WM	TITLE	SCALE	
DE APPR.	DS-#	SKIDTUBE	NT8	
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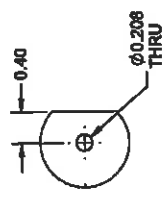
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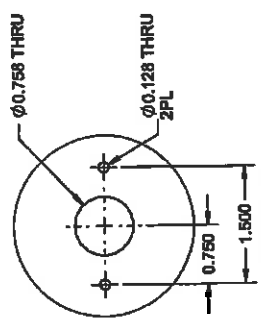
D4680-1 SKIDTUBE BENDING/TRIMMING DETAIL



D4680-1 SKIDTUBE DRILLING DETAIL



DETAIL J
SCALE 8X
2 PL



DETAIL K
SCALE 8X
8 PL

- NOTES:
- 1) MATERIAL: MAKE FROM D2982-150 EXTRUSION
 - 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
 - 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
 - 4) UNITS: INCHES UNLESS OTHERWISE NOTED
 - 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
 - 6) IDENTIFICATION: NONE
 - 7) WEIGHT: 11.38 lbs

DART AEROSPACE USA, INC.					
DESIGN	AP	AP	AP	AP	AP
DRAWN	ML	ML	ML	ML	ML
CHECKED	DP	DP	DP	DP	DP
MFG. APPR.	WM	WM	WM	WM	WM
DE APPR.	DS	DS	DS	DS	DS
DATE					17.03.30
TITLE					SKIDTUBE
DRAWING NO.					D4680
REV. F					SHEET 5 OF 5
SCALE					NTS

RELEASED
2017-08-11

Linda Lacelle

From: Chris Provencal
Sent: Monday, July 23, 2018 10:52 AM
To: Linda Lacelle; Marc Bellavance
Cc: Andrew Sheldon; Jesse White; Jason Leroux
Subject: RE: bahh humbug

Linda,

It is acceptable to ship the D4680-041 skidtubes with prime/paint per QSI 005. ICA-D117-762 Rev. 4. permits the skidtube to be painted. Attach this email to the work order and have someone deviate the work order as "Acceptable per DE #03 attached email"

Chris

From: Linda Lacelle
Sent: Monday, July 23, 2018 7:18 AM
To: Chris Provencal <cprovencal@dartaero.com>; Marc Bellavance <mbellavance@dartaero.com>
Cc: Andrew Sheldon <asheldon@dartaero.com>; Jesse White <jwhite@dartaero.com>; Jason Leroux <jleroux@dartaero.com>
Subject: FW: bahh humbug
Importance: High

Not sure who is on vacation, but these tubes need to ship tomorrow, Tuesday, July 24, can we proceed, as we spray painted them instead of powder coat...we were all so sure that the 145's were spray painted!!

Thx
L

From: Linda Lacelle
Sent: Friday, July 20, 2018 5:07 PM
To: Linda Lacelle <llacelle@dartaero.com>
Subject: Fwd: bahh humbug

Sent from my iPhone

Begin forwarded message:

From: Andrew Sheldon <asheldon@dartaero.com>
Date: July 20, 2018 at 4:55:39 PM GMT-4
To: Linda Lacelle <llacelle@dartaero.com>, Jesse White <jwhite@dartaero.com>
Subject: Re: bahh humbug

everything says powder coat, either way they are painted, would just need eng sign off

From: Linda Lacelle
Sent: Friday, July 20, 2018 4:54:31 PM
To: Andrew Sheldon; Jesse White
Subject: Re: bahh humbug

Nothing on the drwg??? We always painted these! Wtf

Sent from my iPhone

On Jul 20, 2018, at 4:53 PM, Andrew Sheldon <asheldon@dartaero.com> wrote:

nothing about it on the drawing or wo

From: Linda Lacelle
Sent: Friday, July 20, 2018 4:52:38 PM
To: Andrew Sheldon
Subject: Re: bahh humbug

Uh yeah, why???

Sent from my iPhone

On Jul 20, 2018, at 4:51 PM, Andrew Sheldon <asheldon@dartaero.com> wrote:

are the D4680-041's supposed to be painted?

ml 18 June 2019



Entered: _____ Date: 18/07/23

WORK ORDER NON-CONFORMANCE / ROUTE UPDATE

Route update only

NCR No. 19-7151

Job: 179485

Part No. D4680-041 Rev F

DISPOSITION

Rework ☐
Scrap ☐
Use-as-is ☒

DEPARTMENT/PROCESS

Cross tube ☐
Small Fab ☐
Finishing ☒
Rec/Store/Packaging ☐

Engineering ☐
Water Jet ☐
Supplier ☐
Quality ☐

Date: _____

Sequence #: _____

QTY Affected: 1

MRB (QS1042)

18-07-25

Description Work Order Deviation

Skid tubes primed and painted instead. DWG calls for powder coat

Disposition

Use as is. ICA-D117-762 Rev. 4 permits prime and paint. Acceptable per DE#03 attached e-mail.

Completed By

18-07-25

Lead hand / Supervisor

18-07-25

QC / QA Coordinator

18-07-25

Root Cause

Operator ☐
Manufacturing Process ☒
Equipment/Tooling ☐
Handling/Preservation ☐
Material ☐
Product Improvement ☐
Process Improvement ☐
Human Factors ☐

FAULT CATEGORY

Pressure/Forced ☐
Bending ☐
Crushing ☐
Cracks ☐
Crimp/Kink/Ripple/Wave/Twist ☐
Marks/Chatter ☐
Mislabeled ☐
Other/Details: _____

Contamination ☐
Misaligned/off center ☐
BOM/Route ☐
Broken/Damage/Defect ☐
Incomplete/Unclear Instructions ☐
Drill Holes ☐
Fit/Function ☐

Power Loss/Surge ☐
Folio/Program ☐
Grain Direction ☐
Weld ☐
Wrong Stock Pulled ☐
Out of Sequence ☐
Off-set/Set-up ☐

Positioned Wrong ☐
Outside Tolerance ☐
Drawing ☐
Finish ☒
Part Lost/Missing ☐
Misread ☐